



Hermansky-Pudlak syndrome

Hermansky-Pudlak syndrome is a disorder characterized by a condition called oculocutaneous albinism, which causes abnormally light coloring (pigmentation) of the skin, hair, and eyes. Affected individuals typically have fair skin and white or light-colored hair. People with this disorder have a higher than average risk of skin damage and skin cancers caused by long-term sun exposure. Oculocutaneous albinism reduces pigmentation of the colored part of the eye (iris) and the light-sensitive tissue at the back of the eye (retina). Reduced vision, rapid and involuntary eye movements (nystagmus), and increased sensitivity to light (photophobia) are also common in oculocutaneous albinism. In Hermansky-Pudlak syndrome, these vision problems usually remain stable after early childhood.

People with Hermansky-Pudlak syndrome also have problems with blood clotting (coagulation) that lead to easy bruising and prolonged bleeding.

Some individuals with Hermansky-Pudlak syndrome develop breathing problems due to a lung disease called pulmonary fibrosis, which causes scar tissue to form in the lungs. The symptoms of pulmonary fibrosis usually appear during an individual's early thirties and rapidly worsen. Individuals with Hermansky-Pudlak syndrome who develop pulmonary fibrosis often do not live for more than a decade after they begin to experience breathing problems.

Other, less common features of Hermansky-Pudlak syndrome include inflammation of the large intestine (granulomatous colitis) and kidney failure.

There are nine different types of Hermansky-Pudlak syndrome, which can be distinguished by their signs and symptoms and underlying genetic cause. Types 1 and 4 are the most severe forms of the disorder. Types 1, 2, and 4 are the only types associated with pulmonary fibrosis. Individuals with type 3, 5, or 6 have the mildest symptoms. Little is known about the signs, symptoms, and severity of types 7, 8, and 9.

Frequency

Hermansky-Pudlak syndrome is a rare disorder in most populations and is estimated to affect 1 in 500,000 to 1,000,000 individuals worldwide. Type 1 is more common in Puerto Rico, particularly in the northwestern part of the island where about 1 in 1,800 people are affected. Type 3 is common in people from central Puerto Rico. Groups of affected individuals have been identified in many other regions, including India, Japan, the United Kingdom, and Western Europe.

Genetic Changes

At least nine genes are associated with Hermansky-Pudlak syndrome. These genes provide instructions for making proteins that are used to make four distinct protein complexes. These protein complexes play a role in the formation and movement (trafficking) of a group of cell structures called lysosome-related organelles (LROs). LROs are very similar to compartments within the cell called lysosomes, which digest and recycle materials. However, LROs perform specialized functions and are found only in certain cell types. LROs have been identified in pigment-producing cells (melanocytes), blood-clotting cells (platelets), and lung cells.

Mutations in the genes associated with Hermansky-Pudlak syndrome prevent the formation of LROs or impair the functioning of these cell structures. In general, mutations in genes that involve the same protein complex cause similar signs and symptoms. People with this syndrome have oculocutaneous albinism because the LROs within melanocytes cannot produce and distribute the substance that gives skin, hair, and eyes their color (melanin). Bleeding problems are caused by the absence of LROs within platelets, which affects the ability of platelets to stick together and form a blood clot. Mutations in some of the genes that cause Hermansky-Pudlak syndrome affect the normal functioning of LROs in lung cells, leading to pulmonary fibrosis.

Mutations in the *HPS1* gene cause approximately 75 percent of the Hermansky-Pudlak syndrome cases from Puerto Rico. About 45 percent of affected individuals from other populations have mutations in the *HPS1* gene. Mutations in the *HPS3* gene are found in about 25 percent of affected people from Puerto Rico and in approximately 20 percent of affected individuals from other areas. The other genes associated with Hermansky-Pudlak syndrome each account for a small percentage of cases of this condition.

In some people with Hermansky-Pudlak syndrome, the genetic cause of the disorder is unknown.

Inheritance Pattern

This condition is inherited in an autosomal recessive pattern, which means both copies of the gene in each cell have mutations. The parents of an individual with an autosomal recessive condition each carry one copy of the mutated gene, but they typically do not show signs and symptoms of the condition.

Other Names for This Condition

- HPS

Diagnosis & Management

Genetic Testing

- Genetic Testing Registry: Hermansky-Pudlak syndrome
<https://www.ncbi.nlm.nih.gov/gtr/conditions/C0079504/>
- Genetic Testing Registry: Hermansky-Pudlak syndrome 1
<https://www.ncbi.nlm.nih.gov/gtr/conditions/C2931875/>

Other Diagnosis and Management Resources

- GeneReview: Hermansky-Pudlak Syndrome
<https://www.ncbi.nlm.nih.gov/books/NBK1287>
- MedlinePlus Encyclopedia: Albinism
<https://medlineplus.gov/ency/article/001479.htm>
- MedlinePlus Encyclopedia: Colitis
<https://medlineplus.gov/ency/article/001125.htm>

General Information from MedlinePlus

- Diagnostic Tests
<https://medlineplus.gov/diagnostictests.html>
- Drug Therapy
<https://medlineplus.gov/drugtherapy.html>
- Genetic Counseling
<https://medlineplus.gov/geneticcounseling.html>
- Palliative Care
<https://medlineplus.gov/palliativecare.html>
- Surgery and Rehabilitation
<https://medlineplus.gov/surgeryandrehabilitation.html>

Additional Information & Resources

MedlinePlus

- Encyclopedia: Albinism
<https://medlineplus.gov/ency/article/001479.htm>
- Encyclopedia: Colitis
<https://medlineplus.gov/ency/article/001125.htm>
- Health Topic: Platelet Disorders
<https://medlineplus.gov/plateletdisorders.html>

- Health Topic: Pulmonary Fibrosis
<https://medlineplus.gov/pulmonaryfibrosis.html>
- Health Topic: Skin Pigmentation Disorders
<https://medlineplus.gov/skinpigmentationdisorders.html>

Genetic and Rare Diseases Information Center

- Hermansky-Pudlak syndrome
<https://rarediseases.info.nih.gov/diseases/6643/hermansky-pudlak-syndrome>

Educational Resources

- American Thoracic Society
<http://www.thoracic.org/patients/lung-disease-week/2014/rare-lung-disease-ii/general-info.php>
- Disease InfoSearch: Hermansky-Pudlak syndrome
<http://www.diseaseinfosearch.org/Hermansky-Pudlak+syndrome/3391>
- MalaCards: hermansky-pudlak syndrome
http://www.malacards.org/card/hermansky_pudlak_syndrome
- Merck Manual Home Edition: Albinism
<http://www.merckmanuals.com/home/skin-disorders/pigment-disorders/albinism>
- My46 Trait Profile
<https://www.my46.org/trait-document?trait=Hermansky-Pudlak%20syndrome&type=profile>
- Orphanet: Hermansky-Pudlak syndrome
http://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=79430

Patient Support and Advocacy Resources

- American Lung Association: Pulmonary Fibrosis
<http://www.lung.org/lung-health-and-diseases/lung-disease-lookup/pulmonary-fibrosis/>
- Hermansky-Pudlak Syndrome Network
<http://www.hpsnetwork.org/>
- National Organization for Rare Disorders (NORD)
<https://rarediseases.org/rare-diseases/hermansky-pudlak-syndrome/>
- Resource List from the University of Kansas Medical Center: Albinism
<http://www.kumc.edu/gec/support/albinism.html>

GeneReviews

- Hermansky-Pudlak Syndrome
<https://www.ncbi.nlm.nih.gov/books/NBK1287>

ClinicalTrials.gov

- ClinicalTrials.gov
<https://clinicaltrials.gov/ct2/results?cond=%22Hermansky-Pudlak+syndrome%22>

Scientific Articles on PubMed

- PubMed
<https://www.ncbi.nlm.nih.gov/pubmed?term=%28Hermanski-Pudlak+Syndrome%5BMAJR%5D%29+AND+%28Hermansky-Pudlak+syndrome%5BTIAB%5D%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+1800+days%22%5Bdp%5D>

OMIM

- HERMANSKY-PUDLAK SYNDROME 1
<http://omim.org/entry/203300>

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